What is claimed is:

1. A system for operating a plurality of electronic variable optical attenuators (eVOAs), comprising:

a microcontroller connected to the plurality of eVOAs, the microcontroller having means for selecting one eVOA from the plurality of the eVOAs at a time and operating the selected eVOA according to a predetermined method of controlling the selected eVOA within a time slice allocated for the selected eVOA.

2. A system as described in claim 1, wherein the means for selecting and operating further comprises:

a scheduler having a clock for generating the allocated time slice { τ } for monitoring and controlling the selected eVOA;

a processor for calculating the attenuation of the selected eVOA according to the predetermined method of controlling the selected eVOA during the allocated time slice;

a monitor signal processing controller for measuring power of an optical signal at the selected eVOA;

a microprocessing controller for changing an operating attenuation of the selected eVOA in response to a signal received from the processor; and

a means for providing communications between the processor, the monitor signal processing controller, the scheduler and the microprocessing controller.

3. A system as described in claim 2, wherein the monitor signal processing controller for measuring power of an optical signal at the selected eVOA comprises one of the following:

a means for measuring the optical signal power at an input to an eVOA;

a means for measuring the optical signal power at an output of an eVOA; and

a means for measuring the optical signal power at an input to an eVOA and at an output of an eVOA.

4. A system as described in claim 2, wherein the scheduler comprises a means for electronically cycling and scanning the plurality of eVOAs within a response time "*T*" of the microcontroller, wherein $T = n \cdot \tau$, "n" is the number of eVOAs, and τ is the time slice for actively monitoring and controlling each eVOA.

5. A system as described in claim 2, wherein the microprocessing controller comprises a means for determining a required attenuation level and a means for setting the eVOA at said attenuation level.

6. A system as described in claim 5, wherein the microprocessing controller further comprises means for adjusting and updating attenuation of the selected eVOA.

7. A optical system for an optical network comprising the system for operating the plurality of eVOAs as described in claim 1.

8. A method for operating a plurality of eVOAs inserted in optical paths of optical signals propagating in an optical network, comprising the steps of:

(a) selecting an eVOA from the plurality of eVOAs;

(b) operating the selected eVOA according to a predetermined method of controlling said eVOA within a time slice allocated for the selected eVOA; and

(c) repeating the steps (a) to (b) until all eVOAs from the plurality of the eVOAs have been selected; and

(d) repeating the steps (a) to (c) as required.

9. A method as described in claim 8, wherein the step of selecting the eVOA from the plurality of eVOAs comprises continuously cycling through the eVOAs.

10. A method as described in claim 9, wherein the step of cycling comprises one of the following:

cycling through the eVOA in a prescribed order; and

cycling through the eVOAs in a random order.

11. A method as described in claim 9, wherein the step of operating the selected eVOA comprises measuring an optical signal power of the optical signal at the selected eVOA.

12. A method as described in claim 11, wherein the step of measuring the optical signal power {Pmeas} at the selected eVOA comprises one of the following:

measuring the optical signal power at an input to the selected eVOA;

measuring the optical signal power at an output of the selected eVOA; and

measuring the optical signal power at an input to the selected eVOA and at an output of the selected eVOA.

13. A method as described in claim 11, wherein the step of operating the selected eVOA comprises:

setting attenuation of the selected eVOA to a pre-determined fixed value, which is less than a minimum attenuation for the selected eVOA, if a loss-of-signal (LOS) power condition is detected for the selected eVOA;

setting said eVOA attenuation to a pre-determined fixed value, which is less than said minimum attenuation, if the measured power {Pmeas} is greater than a target power {Ptarget} for the selected eVOA; and

setting attenuation of the selected eVOA to a pre-determined fixed value, which is less than said minimum attenuation, if the measured power {Pmeas} is less than the target power {Ptarget} for the selected eVOA.

14. A method as described in claim 9, wherein the step of continuously cycling through the eVOAs comprises the step of scanning the plurality of eVOAs in a specified time period "T", wherein $T = n \cdot \tau$, "n" is the number of eVOAs, and τ is the time slice for controlling each eVOA.

15. A method as described in claim 11, wherein the step of operating the selected eVOA comprises changing the attenuation of said eVOA in one or more variable size intervals (VSI) so that the power of the optical signal substantially equals to the target power {Ptarget}, the

size of the variable interval being a function of the {Pmeas} and {Ptarget}, if the measured optical signal power {Pmeas} differs from a target power {Ptarget} for the selected eVOA.

16. A method as described in claim 15, wherein the step of changing the attenuation of said eVOA in one or more variable size intervals (VSI) comprises changing the attenuation of said eVOA in intervals, whose size in a linear function of the {Pmeas} and {Ptarget}.

17. A method as described in claim 15, wherein the step of changing the attenuation of said eVOA in one or more variable size intervals (VSI) comprises changing the attenuation of said eVOA in intervals, whose size in a non-linear function of the {Pmeas} and {Ptarget}.

18. A method as described in 11, wherein the step of operating the selected eVOA comprises:

measuring the optical signal power at the output of the selected eVOA; and

if the optical signal power is below a loss of signal (LOS) power threshold, setting the attenuation of the selected eVOA to a maximum attenuation (MaxAtt) and modulating the attenuation said eVOA by decreasing and increasing the eVOA attenuation in finite steps until the optical power is detected above the LOS power threshold or the maximum attenuation (MaxAtt) is reached.

19. A method as described in claim 18, wherein the step of selecting the eVOA comprises continuously cycling through the eVOA in a specified time period "τ", wherein $T=n \cdot \tau$, "n" is the number of eVOAs, τ is the time slice for controlling each eVOA; and

further comprises taking time "T_s" for each finite step such that $S * T_s < T$, wherein "S" is the maximum number of finite steps.

20. A method as described in claim 19, wherein the step of modulating the eVOA attenuation in finite steps comprises determining a maximum number of steps "S" for decreasing and increasing the attenuation, an attenuation value per step "A_s", and a predefined protection attenuation (PPA).

21. A method as described in claim 20, wherein the step of modulating the eVOA attenuation in finite steps further comprises:

selecting a stepping down step size for decreasing the eVOA attenuation by A_s such that $\{\text{MaxAtt} - \text{PPA}\} < \text{S} \cdot A_s$; and

selecting a stepping up step size for increasing the eVOA attenuation by A_s such that $\{\text{S} \cdot A_s + \text{PPA}\} < \text{MaxAtt}$.